REMARKS

In the Office Action, the Examiner rejected claims 1-6, 8, 47, 51-55, 57-62, and 64-86. Applicants canceled claims 7, 9-46, 48-50, 56, 63, 88-90, 95, and 96 in previous communications. As discussed below, the Office Action fails to address pending claims 87 and 91-94. By the present Response, Applicants amend claims 57, 68, 79, and 87 to further clarify the claimed subject matter. Applicants respectfully submit that these amendments do not add new matter and are fully supported by the specification. Upon entry of the amendments, claims 1-6, 8, 47, 51-55, 57-62, 64-87, and 91-94 will remain pending in the present patent application. Applicants respectfully request reconsideration of the above-referenced application in view of the foregoing amendments and the following remarks.

Incomplete Action

Applicants note that the Office Action mailed on August 23, 2007, fails to adequately address, or even mention, pending claims 87 and 91-94. Applicants respectfully submit that claims 87 and 91-94 contain allowable subject matter and are currently in condition for allowance. However, if the Examiner disagrees with this assertion, Applicants respectfully request that the Examiner provide an adequate rejection in a future, non-final office action such that Applicants may have a reasonable opportunity to respond.

Double Patenting Rejections

In the Office Action, the Examiner rejected claims 1-6, 8, 47, and 51-55 under the judicially-created doctrine of obviousness-type double patenting in view of claims 1-30 of U.S. Patent No. 6,727,483 ("the '483 patent"). The Examiner also rejected claims 1-6, 8, 47, 51-55, 57-62, and 64-86 under the judicially-created doctrine of obviousness-type double patenting in view of claims 1-28 of U.S. Patent No. 7,015,439 ("the '439 patent"). Applicants respectfully traverse this rejection. More specifically, the Office Action fails to include the minimum factual and legal analysis necessary to establish a *prima facie*

case that the present claims are unpatentable under the doctrine of obviousness-type double patenting in view of claims 1-30 of the '483 patent or claims 1-28 of the '439 patent.

As may be appreciated, a proper analysis leading to an obviousness-type double patenting rejection should parallel that of a 35 U.S.C. § 103 obviousness determination. Manual of Patent Examining Procedure § 804. Thus, the burden of establishing a *prima facie* case of obviousness-type double patenting falls on the Examiner. *See Ex parte Wolters and Kuypers*, 214 U.S.P.Q. 735 (PTO Bd. App. 1979). To establish such a *prima facie* case, the Examiner must not only show that the proposed modification includes all of the claimed elements, but also a convincing line of reason as to why one of ordinary skill in the art would have found the claimed invention to have been obvious in light of the teachings of the references. *Ex parte Clapp*, 227 U.S.P.Q. 972 (B.P.A.I. 1985). The present Office Action fails to provide such a showing.

Particularly, the Office Action merely states that the present claims are not patentably distinct from the claims of the '483 and '439 patents "because the claimed portable induction components are overlapped by portable induction components." Office Action mailed August 23, 2007, pages 2-3. This conclusory statement, absent a reasonable explanation, fails as a matter of law to support the present rejections. Applicants respectfully assert that the present claims recite elements (including, for example, "a *single continuous cooling path* operable to dissipate heat from the fluid-cooled induction heating cable *and* from an electrical lead extending from the portable induction heating system to the fluid-cooled induction heating cable," and "a flow switch … configured to detect the cooling fluid received from the fluid-cooled induction heating cable and to effect discontinuation of the output power when the amount of the cooling fluid received from the fluid-cooled induction heating cable is below a threshold amount") that would not be obvious in view of the other claims noted by the Examiner. Accordingly, Applicants again respectfully request that the Examiner either provide, for

the record, a legally-sufficient basis for the present rejection (including an explanation as to why the Examiner believes each element of the instant claims is obvious in view of the claims of the '483 and '439 patents) or withdraw the rejection.

The Examiner also rejected claims 57-62 and 64-86 under the judicially-created doctrine of obviousness-type double patenting in view of claims 1-30 of U.S. Patent No. 6,727,483 in view of the Somes reference (U.S. Patent No. 2,359,058). Applicants respectfully traverse this rejection. In the Office Action, the Examiner stated that "Somes teaches to use flow switches to insure induction coil is properly cooled. Therefore, using flow switch in induction heating system to insure the induction coil is properly cooled is contemplated within the ambit of ordinary skill artisan." Office Action mailed August 23, 2007, pages 2-3 (errors in original). As discussed below, although the Somes reference discloses flow responsive devices 14 and 17, neither of these devices can be reasonably equated with the flow switch recited by the instant claims. Consequently, for at least the reasons provided below with respect to the instant claims and the Somes reference, Applicants respectfully request withdrawal of the present rejection.

Rejections under 35 U.S.C. § 103

In the Office Action, the Examiner rejected claims 1-6, 8, 47, 51-55, 57-62 and 64-86 under 35 U.S.C. § 103(a) as unpatentable over Henderson et al. (U.S. Patent No. 3,403,240), in view of Couffet et al. (U.S. Patent No. 5,430,274), Antier et al. (U.S. Patent No. 4,058,696), and Duncan (U.S. Patent No. 5,198,053). The Examiner also rejected claims 57-62 and 64-86 under 35 U.S.C. § 103(a) as unpatentable over the same four references in view of a fifth reference, i.e., the Somes reference. In this second rejection, the Examiner indicated that the Henderson et al., Couffet et al., Antier et al., and Duncan references fail to include each recited element of claims 57-62 and 64-86. Consequently, Applicants believe that the inclusion of these claims in the first rejection was merely an oversight by the Examiner in preparing the Office Action. Applicants

respectfully request clarification of the rejections in any future Office Action. To the extent that the rejections are understood, Applicants respectfully traverse these rejections.

Legal Precedent

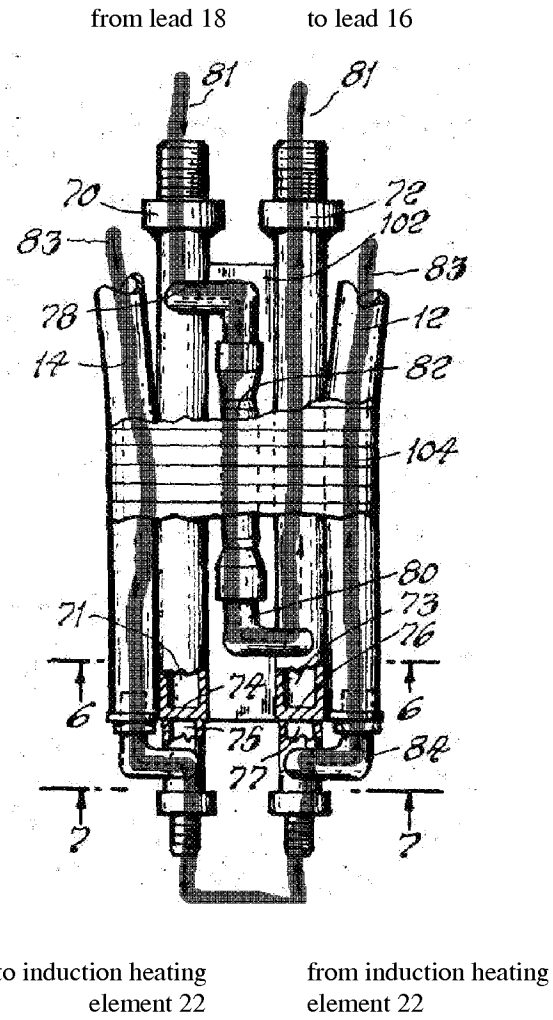
The burden of establishing a *prima facie* case of obviousness falls on the Examiner. *Ex parte Wolters and Kuypers*, 214 U.S.P.Q. 735 (PTO Bd. App. 1979). Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention absent some teaching or suggestion supporting the combination. *ACS Hospital Systems, Inc. v. Montefiore Hospital*, 732 F.2d 1572, 1577, 221 U.S.P.Q. 929, 933 (Fed. Cir. 1984). Accordingly, to establish a *prima facie* case, the Examiner must not only show that the combination includes *all* of the claimed elements, but also a convincing line of reason as to why one of ordinary skill in the art would have found the claimed invention to have been obvious in light of the teachings of the references. *Ex parte Clapp*, 227 U.S.P.Q. 972 (B.P.A.I. 1985). When prior art references require a selected combination to render obvious a subsequent invention, there must be some reason for the combination other than the hindsight gained from the invention itself, i.e., something in the prior art as a whole must suggest the desirability, and thus the obviousness, of making the combination. *Uniroyal Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 5 U.S.P.Q.2d 1434 (Fed. Cir. 1988).

Omitted Features of Independent Claims 1 and 47

Applicants respectfully note that the Henderson et al., Couffet et al., Duncan, and Antier et al. references, even taken collectively, fail to disclose each element of independent claims 1 and 47. For instance, independent claim 1 recites "a cooling unit … configured to cooperate with at least the fluid-cooled induction heating cable to provide a *single continuous cooling path* operable to dissipate heat from the fluid-cooled induction heating cable *and* from an electrical lead extending from the portable induction heating system to the fluid-cooled induction heating cable" (emphasis added). Similarly, independent claim 47 recites "a power source operable to apply output power to *an*

electrical pathway … [including] an induction heating cable adjacent the workpiece, a supply path from the portable heating system to the induction heating cable, and a return path from the induction heating cable to the portable heating system" and "wherein the induction heating cable is a fluid-cooled induction heating cable that cooperates with the cooling unit to form at least a portion of *a single cooling pathway* that is configured to generally extend along the supply path and the return path of the electrical pathway to remove heat therefrom" (emphasis added). Because the cited references fail to disclose such elements, the cited references cannot support a *prima facie* case of obviousness with respect to independent claims 1 and 47.

As will be appreciated, the Henderson et al. reference is generally directed to an induction brazing apparatus. Col. 1, lines 25-30; FIG. 2. More particularly, the Henderson et al. apparatus includes cooling water conduits 12 and 14, and water-cooled electrical conduits 16 and 18, that extend from a work unit 10. Col. 2, lines 23-32. The water-cooled electrical conduits 16 and 18 extend to the handle 20, which is configured to complete a *first* cooling pathway by fluidly connecting the electrical conduits 16 and 18. *See* col. 3, lines 5-21 ("leads 16 and 18 are connected respectively in the same manner to tubular elements 70 and 72"); FIG. 5. The water conduits 12 and 14 extend from the work unit 10 to an induction heating element 22. Col. 3, lines 26-37. Notably, the reference explicitly states that "[s]eparate cooling fluid for the induction heating element 22 is supplied from conduits 12 and 14 …." *Id.* It is, thus, evident that the water conduits 12 and 14 form a portion of a *second* cooling pathway that includes the induction heating element 22. For the Examiner's convenience, these two separate and distinct pathways are indicated in the annotated Fig. 5 of the Henderson et al. reference provided immediately below:



From these passages and the annotated drawing above, it is clear that the *first cooling pathway* (generally indicated by arrows 81) including conduits 16 and 18 removes heat from the electrical leads to the handle 20, while it is the *second cooling pathway* (generally indicated by arrows 83) that removes heat from the induction heating element 22 itself. This is in direct opposition to the recitations of independent claims 1 and 47, which generally recite a *single cooling path* that includes a fluid-cooled induction heating cable and that operates to dissipate heat from *both the fluid-cooled induction heating cable and an electrical lead extending between the induction heating cable and the portable induction heating system.* For this reason, the Henderson et al. reference

cannot be logically considered to disclose the *single* cooling path recited by the instant claims.

Further, the Duncan, Antier et al., and Couffet et al. references fail to obviate this deficiency. Applicants recognize that the Couffet et al. reference was first cited by the Examiner in the Office Action mailed August 23, 2007, but respectfully note that the Examiner relied on this reference as teaching "a cooling tube in the induction conductor to prevent parasitic heating." The Couffet et al. reference does not appear to teach (nor has the Examiner asserted that the reference teaches) a *single cooling path* that operates to dissipate heat from *both the fluid-cooled induction heating cable and an electrical lead extending between the induction heating cable and the portable induction heating system*, as generally recited by the instant claims. Consequently, these cited references, taken alone or in hypothetical combination, fail to teach or suggest each element of independent claims 1 and 47, and do not establish a *prima facie* case of obviousness of claims 1, 47, and their respective dependent claims.

Omitted Features of Independent Claims 57, 68, and 79

Likewise, Applicants respectfully note that the Henderson et al., Couffet et al., Duncan, and Antier et al. references, taken alone or in combination, fail to disclose each element of independent claims 57, 68, and 79. For instance, independent claims 57 and 68 generally recite "a flow switch … configured to detect the cooling fluid *returning from the fluid-cooled induction heating cable* and to effect *discontinuation of* the output power when the amount of the cooling fluid returning from the fluid-cooled induction heating cable *is below a threshold amount*" (emphasis added). Independent claim 79 recites "a flow switch coupled to the programmable power source controller, wherein the flow switch is configured to detect the cooling fluid received from the fluid-cooled induction heating cable and to *communicate with the programmable power source controller such that the programmable power source controller discontinues power output from the power source when the amount of the cooling fluid received from the fluid-cooled*

induction heating cable is below a threshold amount" (emphasis added). As a courtesy, Applicants note that an exemplary flow switch is discussed in the present application at page 23, lines 4-12, and is illustrated in FIG. 14 as element 282. Because the cited references fail to disclose such elements, the cited references fail to establish a *prima facie* case of obviousness with respect to independent claims 57, 68, and 79.

In the Office Action, the Examiner suggested that a solenoid 122, a control box 131, and a check valve 128 of the Henderson et al. reference could be equated with the recited "flow switch." While Applicants do not dispute that these elements of the Henderson et al. reference relate to flow control, the present rejection appears to ignore a substantial portion of the claim recitations regarding the flow switch. The Henderson et al. solenoid 122 actuates a valve 120 to start and stop coolant flow in the Henderson et al. apparatus. Col. 3, lines 65-71. Particularly, the reference states:

> The solenoid 122 is connected by line 129 and control box 131 to a control cable 130 shown in FIG. 4 which in turn is connected to the power supply motor-generator set (not shown) to actuate the valve 120 through solenoid 122 to open position and supply cooling water to the induction heating element 22 only when power is being delivered to the heating element.

Id. In other words, the solenoid 122, via the control box 131, simply opens the valve 120 when power is applied to the heating element 22, and closes the valve 120 when power is not being applied to the heating element 22.

There is no disclosure, suggestion, or even hint in the cited reference that the solenoid 122 or control box 131 somehow "detect cooling fluid," as recited in the present claims. In fact, as described in the cited reference, one skilled in the art would understand that the control box 131 detects a control signal (not cooling fluid) from a control cable 130, and the solenoid 122 detects a control signal (not cooling fluid) transmitted from the control box 131 over the line 129. Further, it is readily apparent that, in the Henderson et

al. reference, the application of power to the heating element 22 by the power supply controls actuation of the solenoid 122; the solenoid 122 *does not* control the application of power to the heating element 22. As neither the solenoid 122 of the control box 131 detect cooling fluid, it is also evident that neither of these elements is configured "*to effect discontinuation of the output power when the amount of the cooling fluid* returning from the fluid-cooled induction heating cable *is below a threshold amount*" (emphasis added). Additionally, the check valve 128 merely prevents water from flowing from a drain manifold 114 to the heating element 22; the cited reference does not teach, disclose, or even hint that the check valve 128 provides the functionality discussed above and recited in the instant claims. For at least these reasons, the solenoid 122, the check valve 128, and the control box 131 cannot be logically equated with the "flow switch" recited in the present claims. Further, the Duncan, Antier et al., and Couffet et al. references fail to obviate this deficiency. Consequently, these cited references, taken alone or in hypothetical combination, fail to teach or suggest each element of independent claims 57, 68, and 79, and do not establish a *prima facie* case of obviousness with respect to these independent claims or their respective dependent claims.

In a second rejection, the Examiner additionally cited the Somes reference in an apparent attempt to remedy the above noted deficiency. The Somes reference is generally directed to an assembly including separate heating and quenching heads for inductively heating and cooling a workpiece. Page 1, first column, lines 1-11. The disclosed apparatus includes a fluid-cooled inducing head 10 (including an inducing coil 23) configured to engage a separate quench head 13. Page 1, second column, lines 42-49; page 2, first column, lines 32-37; FIGS. 1 and 2. In the Somes system, coolant is first routed into the structure via a supply passage 11 (FIG. 3), and then through an outer bore 26 (FIG. 3), a passage 27 (FIG. 3), a passage 28 (FIGS. 3 and 2, sequentially), an annular passage 29 (FIG. 2), a radial passage 30 (FIG. 2), and into a helical passage 31 (FIG. 2) in the coil 23. Page 2, first column, lines 38-44. Once the coolant passes through the helical passage 31, it is routed through a lower passage 32 and into a central chamber 33,

as illustrated in FIG. 2. Page 2, first column, lines 44-46. The central chamber 33 contains a ball valve 35 that normally rests against a seat 36, generally causing the coolant to pass from the central chamber 33 to a central passage 34 (which is coaxial with the bore 26, as illustrated in FIGS. 2-4) and then out of the structure via an outlet passage 12 (FIG. 4). Page 2, first column, lines 46-54. However, during a heating operation, a central projecting stem 37 of the quench head 13 pushes the ball valve 35 away from its seat 36, upon which the coolant from the inducing coil (or helical passage 31) is routed through the seat 36 and into the quench head 13, rather than returning to the outlet passage 12. *See, e.g.*, page 2, first column, lines 46-66; FIG. 2.

Notably, the Somes system also includes a flow responsive device 14 in the coolant supply passage 11 and a flow responsive device 17 in the coolant outlet passage 12. Page 2, first column, lines 10-22; FIG. 5. These two devices are coupled to electrical switches 15 and 18, respectively, for opening or closing a circuit 16 that provides electrical current to the inducing head 10. *Id.* The flow device 14 is configured to close the normally-open switch 15 (allowing current to flow to the inducing head 10) only upon a sufficient flow of coolant through the supply passage 11. *See* Page 2, second column, lines 24-46. Conversely, the flow device 17 is configured to open the normally-closed switch 18 (stopping current from flowing to the inducing head 10) if coolant flow through the outlet passage 12 is above a certain level that indicates valve 35 is closed (i.e., that the inducing head 10 is no longer engaging the quench head 13). *See id.*

In the Office Action, the Examiner suggested that "Somes teaches flow switch that deenergized induction heating coil when said coil is not properly cooled." Office Action mailed August 23, 2007, page 5. Applicants, however, again respectfully note that claims 57 and 68 generally recite "a flow switch … *configured to detect the cooling fluid returning from the fluid-cooled induction heating cable* and to effect *discontinuation of the output power when the amount of the cooling fluid returning from the fluid-cooled induction heating cable is below a threshold amount*" (emphasis added). Independent

claim 79 recites "a flow switch coupled to the programmable power source controller, wherein the flow switch is configured to detect the cooling fluid received from the fluid-cooled induction heating cable and to *communicate with the programmable power source controller such that the programmable power source controller discontinues power output from the power source when the amount of the cooling fluid received from the fluid-cooled induction heating cable is below a threshold amount*" (emphasis added).

In sharp contrast, the flow sensing device 14 (and associated switch 15) of the Somes reference does not receive coolant returning from the inducing head 10 and, thus, cannot be reasonably equated with a flow switch "configured to detect the cooling fluid returning from the fluid-cooled induction heating cable." The flow sensing device 17 (and associated switch 18) is, indeed, downstream from the inducing head 10 of the Somes system. This device 17, however, is configured such that power is *delivered* to the inducing head 10 when the amount of coolant in the outlet passage 12 (i.e., returning from the inducing head 10) is below a certain level, and discontinues power output only when the amount of coolant returning from the inducing head 10 is *above* a certain level. In short, the flow sensing device 17 operates in a manner diametrically opposed to, and cannot be logically equated with, the flow switch recited in the instant claims. Consequently, Applicants respectfully submit that the Somes reference fails to obviate the deficiencies of the Henderson et al., Couffet et al., Antier et al., and Duncan references. Further, because they fail to teach each and every element, these cited references do not establish a *prima facie* case of obviousness with respect to independent claims 57, 68, and 79, or their respective dependent claims.

As a final matter, Applicants respectfully note that various claims, including independent claims 79 and 87, generally recite the recycling of cooling fluid within a portable heating system. In a previous Office Action, the Examiner relied on the Cydzik et al. (U.S. Patent No. 5,874,713) reference as disclosing such a feature. Applicants do not necessarily believe that the Examiner's reliance on this reference was proper, but

respectfully note that this reference was not mentioned in the present Office Action, nor were such recitations addressed by the Examiner. Consequently, Applicants respectfully request that the Examiner either allow such claims, or clarify the grounds of rejection in any future Office Action to correct this deficiency.

For at least these reasons, Applicants respectfully request withdrawal of the rejections under 35 U.S.C. § 103 and allowance of claims 1-6, 8, 47, 51-55, 57-62, and 64-86, in addition to claims 87 and 91-94 as discussed above.

Conclusion

In view of the remarks and amendments set forth above, Applicants respectfully request allowance of the pending claims. If the Examiner believes that a telephonic interview will help speed this application toward issuance, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,

Date: November 20, 2007

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